Amendment to Claims

This listing of claims will replace all prior versions and listings of claims in the application.

Claims 1 – 13 (Cancelled).

14. (Withdrawn) A homeostatic control system for dynamically determining inertial orientation of a body in three dimensions comprising:

an X-axis sensor system positioned in an X plane of said body and including at least three first sensors that sense acceleration and gravity in said X plane and at least three second sensors that sense acceleration only in said X plane;

a Y-axis sensor system positioned in an Y plane of said body and including at least three first sensors that sense acceleration and gravity in said Y plane and at least three second sensors that sense acceleration only in said Y plane;

a Z-axis sensor system positioned in a Z plane of said body and including at least one sensor that senses yaw in said Z plane; and

control circuitry operably connected to all of said sensor systems to process signals produced by said sensors in order to dynamically determine an inertial orientation of said body in three dimensions based on a continuous determination of true down.

15. (Withdrawn) An electrically powered flying saucer comprising:

a flying saucer body housing within said body at least four generally downwardly directed thrusters, each thruster mechanically powered by at least one permanent magnet motor that generates at least a portion of the mechanical power provided to said thruster by switching magnetic flux from at least one permanent magnet through at least one laminate; and

an electrical power source operably connected to said thrusters and carried within said body, said electrical power source having a current storage capacity and a weight that enable said saucer to achieve a lift to weight ratio of at least 2:1.

16. (Withdrawn) A radio controlled (RC) flying saucer remotely controlled by a hand-held RC controller, said RC flying saucer comprising:

a flying saucer body housing within said body at least four generally downwardly directed thrusters, said body being comprised of a foam material;

an electrical power source operably connected to said thrusters and carried within said body; and

control circuitry operably connected to said thrusters and said electrical power source, said control circuitry including a radio frequency (RF) transceiver providing two-way RF communications between said flying saucer and said hand-held RC controller.

17. (Withdrawn) A radio controlled (RC) flying saucer remotely controlled by a hand-held RC controller, said RC flying saucer comprising:

a flying saucer body housing within said body an even number N of ducted fans where N is greater than 2, each ducted fan oriented generally downward and at an angle of greater than 10 degrees and less than 15 degrees to vertical;

an electrical power source operably connected to said thrusters and carried within said body; and

control circuitry operably connected to said thrusters and said electrical power source, said control circuitry including a radio frequency (RF) receiver enabling RF communications from said hand-held RC controller to said flying saucer.

18. (Withdrawn) The RC flying saucer of claim 17 wherein each of said ducted fans comprises:

a duct assembly, said duct assembly including a motor mount;

a motor dimensioned to be received in said motor mount, said motor comprising an exterior rotating rotor and an interior fixed stator that is operably mountable in said motor mount; and

a fan blade operably mountable on said exterior rotating rotor.

19. (Withdrawn) The RC flying saucer of claim 18 wherein said fan blade comprises at least six blades extending from a central mounting hub that is generally concentrically aligned with said motor mount to an exterior ring that is attached to each blade.

20. (Withdrawn) The RC flying saucer of claim 16 wherein each ducted fan includes at least six blades that are angled at a constant attack angle across a chord of each blade, said attack angle being greater than 20 degrees and less than 40 degrees.

21. (Withdrawn) The RC flying saucer of claim 16 wherein each ducted fan comprises a two-piece duct assembly, including an upper duct portion and a lower duct portion, each duct portion having structure that mechanically mates with said flying saucer body and structure for mechanically mates with the other duct portion when said duct portions are assembled from opposite sides into said flying saucer body.

22. (Withdrawn) A radio controlled (RC) aircraft remotely controlled by a hand-held RC controller comprising:

said RC controller including: a body adapted to be held in one hand;
a homeostatic control system positioned within said body to sense a desired orientation of said RC controller by a user selectively positioning an orientation of said RC controller, said homeostatic control system including an XYZ sensor arrangement and associated control circuitry that dynamically determines an inertial gravitational reference for use in sensing said desired orientation;
a bidirectional radio frequency (RF) transceiver providing two-way RF communications between said RC aircraft and said hand-held RC

controller that communicates said desired orientation to said RC aircraft; and

said RC aircraft including: at least one motor that provides motive force to said RC aircraft; a power source operably connected to said at least one motor and carried within said RC aircraft;

a homeostatic control system operably connected to said at least one motor to automatically control said motor in order to maintain said desired orientation of said RC aircraft, said homeostatic control system including an XYZ sensor arrangement and associated control circuitry that dynamically determines an inertial gravitational reference for use in automatic control of said at least one motor; and

a bidirectional radio frequency (RF) transceiver providing two-way RF communications between said RC aircraft and said hand-held RC controller.

23. (New) A radio controlled (RC) homeostatic flying hovercraft comprising:

a flying structure having lift generated by at least four electrically, powered generally downwardly directed thrusters, said flying structure including:

a homeostatic control system operably connected to said thrusters that automatically controls a thrust produced by each thruster in order to automatically maintain a desired orientation of said flying structure, said homeostatic control system including at least a three dimensional sensor system and associated control circuitry that dynamically determines an inertial gravitational reference for use by said homeostatic control system in automatic control of said thrusters;

a radio frequency (RF) receiver; and

a battery system electrically coupled to said thrusters, said RF receiver and said homeostatic control system; and

an RC controller separate and remote from said flying structure and adapted to control said desired orientation of said flying structure, said RC controller including:

a handheld structure housing a sensor system that senses at least a two dimensional sensed orientation of said handheld structure as a result of a user remote from said flying structure selectively orienting said handheld structure; and

an RF transmitter that communicates information based on said sensed orientation to said receiver of said flying structure as said desired orientation used by said homeostatic control system to automatically control said thrusters to maintain said desired orientation.

24. (New) The RC homeostatic flying hovercraft of claim 23 wherein said flying structure comprises a body housing said thrusters within a perimeter of said body.

25. (New) The RC homeostatic flying hovercraft of claim 23 wherein each of said thrusters comprises an electrically powered ducted fan.

26. (New) The RC homeostatic flying hovercraft of claim 23 wherein said RF receiver of said flying structure and said RF transmitter of said RC controller are each RF transceivers providing two-way RF communications between said flying structure and said RC controller.

27. (New) The RC homeostatic flying hovercraft of claim 23 wherein each of said thrusters is positioned in said flying structure so as to be tilted at an angle relative to downward when said flying structure is in a horizontal orientation, said angle being less than about 15 degree.

28. (New) A radio controlled (RC) homeostatic flying hovercraft comprising:

a flying structure including:

at least four electrically, powered generally downwardly directed thrusters;

sensing means for dynamically determining an actual orientation of said flying structure;

control means for automatically controlling a thrust produced by each of said thrusters to maintain a desired orientation of said flying structure in response to said actual orientation;

radio means for radio frequency (RF) communication of said desired orientation; and

battery means for providing electrical power to said thrusters, said control means and said radio means; and

an RC controller separate and remote from said flying structure including:

a handheld structure housing means for sensing at least a two dimensional sensed orientation of said handheld structure in response to a user remote from said flying structure selectively orienting said handheld structure; and

radio means for RF communication of information based on said sensed orientation with said radio means of said flying structure as said desired orientation for said control means automatically controlling said thrusters.

29. (New) The RC homeostatic flying hovercraft of claim 28 wherein said flying structure comprises means for housing said thrusters, said sensing means, said control means, said radio mean and said battery means within a perimeter of said means for housing.

30. (New) The RC homeostatic flying hovercraft of claim 28 where said radio mean of said flying structure and said RC controller are each RF transceivers providing two-way RF communications between said flying structure and said RC controller.

31. (New) The RC homeostatic flying hovercraft of claim 28 where said control means automatically controls said thrusters to maintain moment-to-moment balance and stabilization of said flying structure such that said desired orientation includes information only for an intended orientation of said flying structure and

an intended motion in which said flying structure is to be directed without information for control of moment-to-moment balance and stabilization of said flying structure.

32. (New) A method for operating a radio controlled (RC) homeostatic flying hovercraft having at least four battery powered generally downwardly directed thrusters using an RC controller separate and remote from said flying hovercraft, said method comprising:

providing as part of said RC controller a handheld structure housing a sensor system;

using said sensor system in said RC control to sense at least a two dimensional sensed orientation of said handheld structure in response to a user remote from said flying structure selectively orienting said handheld structure;

communicating a desired orientation by radio frequency (RF) communication information to said flying hovercraft, said desired orientation including information based on said sensed orientation of said handheld structure;

using a sensor system in said flying hovercraft to dynamically determine an actual orientation of said flying hovercraft;

using control circuitry in said flying hovercraft to automatically and dynamically control a thrust produced by each of said thrusters to achieve and homeostatically maintain said actual orientation of said flying hovercraft in response to said desired orientation communicated to said flying hovercraft and said actual orientation determined by said sensor system in said flying hovercraft without additional control information communicated to said flying hovercraft.